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| <b>I. Patent opposed</b>   |  | Opp. No. <b>OPPO (1)</b> |  |
| Patent No. <b>EP1423016</b>  |  |                          |  |
| Application No. <b>02755233.0</b>  |  |                          |  |
| Date of mention of the grant in the European Patent Bulletin (Art. 97(4), 99(1) EPC) <b>04/10/2006</b>       |  |                          |  |
| Title of the invention:<br><b>COLLAGEN CASING</b>  |  |                          |  |
| <b>II. Proprietor of the Patent</b> <b>Devro Plc</b><br>first named in the patent specification              |  |                          |  |
| Opponent's or representative's reference (max. 15 spaces)  |  | <b>20070398</b>          |  |
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|   |  |                  |                                     |
|---|--|------------------|-------------------------------------|
| <b>V. Opposition is filed against</b><br>— the patent as a whole <input checked="" type="checkbox"/><br>— claim(s) No(s). <input type="checkbox"/>  |  | for EPO use only |                                     |
| <b>VI. Grounds for opposition:</b><br><b>Opposition is based on the following grounds:</b><br>(a) the subject-matter of the European patent opposed is not patentable (Art. 100(a) EPC) because:<br>— it is not new (Art. 52(1); 54 EPC) <input checked="" type="checkbox"/><br>— it does not involve an inventive step (Art. 52(1); 56 EPC) <input checked="" type="checkbox"/><br>— patentability is excluded on other grounds, i. e. Art. <input type="checkbox"/><br>(b) the patent opposed does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Art. 100(b) EPC; see Art. 83 EPC). <input checked="" type="checkbox"/><br>(c) the subject-matter of the patent opposed extends beyond the content of the application/ of the earlier application as filed (Art. 100(c) EPC; see Art. 123(2) EPC). <input type="checkbox"/> |  |                  |                                     |
| <b>VII. Facts and arguments</b><br>(Rule 55(c) EPC)<br>presented in support of the opposition are submitted herewith on a separate sheet (annex 1)  |  |                  | <input checked="" type="checkbox"/> |
| <b>VIII. Other requests:</b><br>Oral proceedings are requested should the EPO not intend to revoke the opposed patent in its entirety   |  |                  |                                     |



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|    | Code |  | Currency | Amount |
|----|------|--|----------|--------|
| 04 | 001  | Filing fee   | EUR      |        |
| 05 | 002  | Search fee   | EUR      |        |
| 06 | 005  | Designation fee(s) <sup>3</sup>                              | EUR      |        |
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| 22 |      | Total  | EUR      | 635.00 |

Signature

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Explanations 1-4 are omitted.

Madrid, 2 July 2007

Place, date

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#### Opposition to European Patent No. 1423016 B1

Proprietor: Devro Plc.

Title: "Collagen casing"

#### Documents used for the opposition

The following documents will be used in this opposition for attacking the claims of EP 1423016:

- ES 2017564 (document D1) and its translation into English.
- GB 2359241 (document D2).
- CN 1045364 (document D3) and its translation into English.
- "Physical chemistry of leather making" Robert E. Krieger publishing company 1983 (Document D4).
- "Química técnica de tenería" Igualada 1985 (document D5) and its translation into English.

All of these documents were published before the priority date of the opposed patent (25/08/2001) and so each of them is state of the art in the sense of Art. 54(2) EPC.

#### CLAIM 1

##### a) Novelty and inventive step (Art. 100.a)

Claim 1 of EP 1423016 B1 defines:

- i) an extruded tubular food-product casing made from an extrudable gel;
- ii) the casing on a dry weight basis, comprising collagen, fat and a humectant
- iii) and wherein the collagen content of the casing consists essentially of porcine collagen and the ratio of collagen to fat is at least 2.5 to 1.

It is submitted that claim 1 is not novel in view of D1.

Document D1 is directed to an extruded tubular food-product casings made from an extrudable gel and so D1 anticipates point i). This can be checked in page 1 lines 5-9 of D1 (references are made to the English text) where it is summarized that the invention belongs to the field of collagen pastes

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which by extrusion and coagulation provide casings for sausages of diverse characteristics. It is also stated in page 2 lines 13-17 that the collagen pastes provides by extrusion and coagulation casings for sausages with a wide range of properties regarding the quickness and strength of coagulation in brine and the strength and flexibility of the final casing.

Further, D1 also discloses that the casing comprises collagen (this is evident from the overall specification), fat (see page 3 lines 6-12 or page 3 lines 28-30) and a humectant (see page 7 line 29-30 where propanotriol also called glycerol, one of the humectants used in EP 1423016 page 3 line 36, is cited as an additive). Therefore, D1 also anticipates point ii).

Finally, D1 discloses that the collagen content of the casings consists essentially of porcine collagen (see page 2 lines 24-25 where it is stated that porcine may be in a proportion of up to 100% or page 7 line 10 where it is explained that in some embodiments only 100% porcine components will be used) and that the ratio of collagen to fat is at least 2.5 to 1. The latter feature must be explained with more detail as it is not as self-evident as the others.

As mentioned in EP 1423016 paragraph 12, it is commonly known that that the natural pigskin or pig hides have a collagen to fat ratio in the range of 1.5:1 to 1:1, in average 1.25:1. On the other hand, it is known from D4 and D5 that the fat content in pig skin varies within a range of 4-40%. If we now focus in section "preparing the pig hide" in page 3 of D1, it is stated that the percentage of fat in the skin depends on the region of the body from which they come from but that they can reach up to 30% which is within the range cited in D4 and D5. For the sake of explanation, we will take this 30% as the value of fat of natural pig skin. This in combination with the assertion that pig skin has a collagen to fat ratio of 1.25:1 in average implies that a pig skin with 30% of fat presents a 37,5% of collagen ( $30 \times 1,25 = 37,5$ ). The rest are other skin components (32,5%). Following the indications of "preparing the pig hide" of D1, it is taught that the fat level must be conveniently reduced (see page 3 line 7). Specifically, it is taught that the final percentage is typically reduced to 2% of fat, although it can reach up to 15% for some specific applications (see page 3 lines 28-30). If the pig skin is reduced in its fat content from 30 to 2% this affects the ratio of collagen to fat which will become now higher. Now the ratio of collagen to fat will be 26,3:1.

Following the same reasoning but with a reduction to 15% of the fat instead to 2% the ratio of collagen to fat will be 3,0:1.

The following table, shows the ratios of collagen to fat resulting from defatting pig skins with different starting contents of fat (40%, 35%, 25%, 20%) to a final content of fat of 2% to 15% and taking an average initial collagen to fat ratio of 1,25:1.

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| TABLE Ratio Collagen/Fat                       |                      |                           |  |     |      |      |
|--|----------------------|---------------------------|--|-----|------|------|
| Starting<br>contents of<br>fat in pig<br>skins | %Collagen<br>of skin | %Other skin<br>components | Final fat contents of pig skin after de-<br>fating (%) |     |      |      |
|  |                      |                           | 15   | 10  | 6    | 3    |
| 40,0   | 50,0                 | 10,0                      | 4,7  | 7,5 | 13,1 | 40,3 |
| 35,0   | 43,8                 | 21,3                      | 3,8  | 6,1 | 10,5 | 33,0 |
| 25,0   | 31,3                 | 43,8                      | 2,4  | 3,8 | 6,5  | 20,4 |
| 20,0   | 25,0                 | 55,0                      | 1,8  | 2,8 | 4,9  | 15,3 |

Therefore, the ratio of collagen to fat is out of the range claimed in claim 1 only when a skin with a starting fat content of 25 or 20% is reduced in its fat content to 15%. In all the other cases D1 anticipates the collagen to fat ratio defined in claim 1. Therefore, it is clear that D1 discloses point iii).

Therefore, claim 1 is clearly not novel in view of D1.

Moreover, it is considered that claim 1 lacks inventive step in view of D2 or D3. As stated in patent EP 1423016, the invention is based in the discovery that the fat content must be brought to a reduced level compared to natural levels (see paragraph 10) in order to obtain porcine collagen casings with improved properties (see paragraph 4). The latter feature was known from D2 (see abstract or example 1 step 1) and from D3 (see claim 2 from the patent translation).

Although D2 does not correspond exactly to the same technical field, it belongs to a very neighbouring field (porcine collagen membranes) and so a skilled person would have been prompted to look at it. A skilled person seeking for solutions to improve the properties of a porcine collagen casing would have realised from D2 that the fat content is a key point in the mechanical properties of the final porcine collagen product (see page 21 lines 30-32). Therefrom, a skilled person would have tried to vary the content of fat from the natural pig skin with routine experimentation so as to arrive to the desired mechanical properties in the final collagen product. Furthermore, from claim 7 or page 18 line 21-22 of D2 a skilled person would have readily understood that working with a fat content of 10% or less would be a desirable range to work. The fact that a certain range is already suggested or disclosed in D2 makes the routine experimentation easier to be carried out since said experimentation is already focused to a narrow range.

A similar reasoning may be used against the inventive step of claim 1 based on D3 with the difference that, in this case, D3 belongs to the same technical field, i.e. to the field of porcine collagen casings. The defatting step can be checked in claim 1 step 3 page 2 and in step 3 of the method described in the specification (page 3) of D3.

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**b) Insufficiency of disclosure (Art. 100.b)**

From the overall content of the EP 1423016 patent, it is derived that the aim of the invention is to obtain a porcine collagen casing having improved properties particularly improved tensile strength (see paragraph 4). This is based as stated in the patent in the discovery that the fat content of the collagen product must be brought to a reduced level compared to natural level (see paragraph 10).

In the case of claim 1, this level is defined by a range of at least 2.5 to 1. On the other hand, the patent teaches that a certain proportion of fat is necessary to improve the appearance of the casing and to improve the cooking properties of the casing (see paragraph 16 lines 17-19). Specifically, it is stated that the fat content should not be less than 3% and especially not less than 1% by weight (see paragraph 16 line 17). Moreover, some specific ranges of ratio of collagen/fat are disclosed in the patent; in paragraph 16 lines 15-17 these ranges are 2.5:1 to 20:1, particularly 3:1 to 15:1, especially 3.5:1 to 10:1 and also 15:1 to 25:1.

This is inconsistent with the range defined in claim 1 which establishes a range of at least 2.5:1. As there is no upper limit in the definition of this range in claim 1, a collagen casing having no fat at all is included ( $\infty$ :1). Thus we believe that the lack of an upper limit in the definition of claim 1 is not supported by the description and implies an insufficient disclosure. It is submitted that if a skilled person uses a collagen casing with no fat he will not achieve the object of the invention disclosed in the patent EP 1423016.

**CLAIM 2**

Claim 2 is dependent on claim 1 and adds the feature that the humectant is glycerol and is present in the range of 14-25%, preferably 16-22%.

D1 is the closest prior art since it shares most of the features of claim 2. Specifically, glycerol is cited as one of the possible additives to be included in the composition of the collagen paste, although it is called by its chemical name propanotriol (see page 7 lines 30).

With regard to the range defined for glycerol, the patent EP 1423016 is silent about any specific technical effect achieved by the application of said range. We actually want to note that examples 3-9 are silent about the range of glycerol used. This indicates that it is not an essential feature but rather an arbitrary feature. We believe that this is an arbitrary range which cannot be used for justifying in any case an inventive step. We feel that this arbitrary range has not to be taken into account while assessing inventive step.

For the above reasons, we believe that current claim 1 is not inventive in the light of D1.

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**CLAIM 3**

Claim 3 is dependent on claim 2 and it adds the feature that a proportion of glycerol is replaced by the same weight of a food grade polyol, such as sorbitol or mannitol or mixtures thereof.

It is interesting to note that D1 also mentions other softeners such as sorbitol or mannitol (see page 7 lines 29-30). It is noteworthy that D1 also mentions the possibility of mixing various softeners (see page 7 line 30)

Therefore, with a similar reasoning as for claim 2, we believe that claim 3 is not inventive in the light of D1.

**CLAIM 4**

Claim 4 depends on the previous claims and adds the feature that the casing includes an agent for modifying the shrink tension of the casing.

Thus, following the novelty attack to claim 1 based on D1, it has to be noted that D1 further mentions the use of an agent for modifying shrink tension. Specifically D1 discloses the use of cellulose, hydroxypropylmethylcellulose, sodium alginate, carboxymethyl cellulose, methylcellulose, propylenglycol alginate or mixtures thereof (see page 7 lines 24-27).

Therefore it is submitted that claim 4 is not novel in view of D1.

**CLAIM 5**

Claim 5 is dependent on claim 4 and it specifies that the agent modifying the shrink tension is cellulose.

As already commented for claim 4, document D1 specifically mentions cellulose. Therefore, claim 5 is not novel in the light of D1.

**CLAIM 6**

Claim 6 is also dependent on claim 4 and defines more specific agents modifying shrink tension. Claim 6 specifically defines methylcellulose, hydroxypropyl methylcellulose, non-ionic alginates (preferably propylenglycol alginate), gums or starches or combinations thereof.

As already argued for claim 4, D1 specifically mentions most of the shrink tension modifiers defined in claim 6. Therefore claim 6 is not novel in view of D1.

**CLAIM 7**

Claim 7 is dependent from any of the preceding claims and it adds the feature that the casing is free of bovine collagen.

Thus, following the novelty attack to claim 1 based on D1, it has to be highlighted again that D1 contemplates the possibility that the collagen has a 0% bovine origin. This is established in page 2 lines 24-25.



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Therefore, it is submitted that present claim 7 is not novel in the light of D1.

**CLAIM 8**

Claim 7 is dependent on any of the preceding claims and it adds the feature that the collagen content of the casing consists only of porcine collagen.

Following the novelty attack to claim 1 based on D1, and inversely to the attack made for claim 7 document D1 contemplates the possibility that the collagen has a 100% porcine origin. This is established in page 2 lines 24-25.

Therefore, present claim 8 is not novel in the light of D1.

**CLAIM 9**

Claim 9 is dependent in any of claims 1-7 and adds the feature that the collagen content of the casing consists of a mixture of porcine collagen and other collagen which is non bovine collagen.

Following the novelty attack to claim 1 based on D1, it is submitted that document D1 further contemplates the use of fowl skins (see page 2 line 13).

Therefore, claim 9 is not novel in view of D1.

**CLAIM 10**

Claim 10 is dependent on claim 9 and adds the features that the porcine collagen forms at least 85% of the gel, preferably 90% of the gel on a dry weight basis.

This attack is a continuation of the attack to claim 9 and D1 besides containing all the features contained therein also discloses the additional feature of claim 10. D1 contemplates the possibility that without taking into account fowl skins and intestines, pork can be in proportions of 0-100% (see page 2 lines 24-25) and besides, in page 2 line 26-27 it is specified that fowl skins will generally not reach 50% of the sum of the others. Therefore a situation where porcine collagen is present in at least 85% and fowl collagen in 15% is disclosed in D1.

Therefore it is submitted that claim 10 is not novel in view of D1.

**CLAIM 11**

Claim 11 is dependent on claim 9 or 10 and it adds the features that the non-bovine collagen is derived from sheep, goats, poultry, birds or fish.

As we have already explained while attacking claim 9 and 10, D1 contemplates the use of collagen from fowl skin and so claim 11 is not novel in view of D1.

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**CLAIM 12**

Claim 12 depends from any of its preceding claims and it adds the feature that the porcine collagen is derived from pig hide or intestine.

Following the attack to claim 1 based on D1, it is additionally submitted that D1 discloses that porcine collagen may be derived from pig hides (see page 3 lines 3-4) or intestine (see page 5 line 25).

Therefore, claim 12 is not novel in the light of D1.

**CLAIM 13**

This claim has mistakenly been granted depending from claim 11 as it adds a feature that the hide is a full hide. It is believed that it should depend on claim 12.

In any case, D1 specifically discloses that the hides used are full hides (see page 3 line 3).

Therefore, claim 13 is not novel in view of D1.

**CLAIM 14**

This claim was also mistakenly granted depending from claim 11 instead from claim 12. It adds the features that the hides are split hides.

Analogously, to the attack made for claim 13, it is noted that D1 discloses that split hides may also be used (see page 3 line 3).

Therefore, claim 14 is not novel in view of D1.

**CLAIM 15**

Claim 15 depends on claim 12-14 and it adds the feature that the pig hide is sow hide.

It is submitted that from the specification of EP1423016 the feature of the pig hide being a sow hide is not connected to any technical effect that might serve to justify the inventive step of claim 15. Therefore it is believed that, despite D1 does not refer to sows, a skilled person in view of D1 would readily understand in an obvious manner that he would be able to work with pig hides (male skin) or sow hides (female skin).

Therefore, claim 15 is not considered to involve any inventive step in the light of D1.

**CLAIM 16**

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Claim 16 is dependent from claim 11-15 and it adds the feature that at least 85 and preferably 90% of the porcine collagen content of the casing is derived from pig hide.

The arguments used for attacking claim 10 are equally valid for attacking claim 16, with the addition that porcine collagen is derived from pig hide as already explained for claim 12-15.

Therefore claim 16 is not novel in view of D1.

**CLAIM 17**

Claim 17 is dependent from any of its preceding claims and it adds the features that the fat content is less than or equal to 30%\*, preferably less or equal to 25%, more preferably less or equal to 20% and most preferably less than 10%.

From the novelty attack to claim 1 based on D1, it is added that D1 specifically teaches that the fat from the pig skin is reduced to a typical value of 2%.

Therefore, claim 17 is not novel in view of D1.

**CLAIM 18**

Claim 17 is dependent on claim 16 and it specifies that the fat content is not less than 3% and preferably not less than 1%.

The same comments made for claim 17 are useful for establishing the lack of novelty of claim 18 based on D1.

**CLAIM 19**

Claim 19 is depending from claim 1-16 and it specifies that the ratio of collagen to fat is at least 3, particularly at least 3.5, especially at least 4 to 1 and most especially above 10 to 1.

The arguments already presented for claim 1 attack on novelty are equally useful to establish that claim 19 is anticipated by D1.

**CLAIM 20**

Claim 20 is dependent on claim 19 and it further specifies the collagen to fat ratio ranges of 2.5:1 to 20:1 or 15:1 to 25:1.

Again, the arguments already presented for claim 1 attack on novelty are equally useful to establish that claim 20 is anticipated by D1.

**CLAIM 21**

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Claim 21 is dependent from any of its preceding claims and it further defines that the porcine collagen is derived from alkaline treated sow hides or alkaline treated young pig hides.

Following the attack to claim 1 based on D1, it is noted that the additional feature of the porcine collagen being derived from alkaline treated sow hides is also disclosed in D1 (see for example page 3 lines 24-25). In this passage the pig hide is treated with calcium hydroxide a well known alkaline compound.

With regard to the fact that the pig hides come from sows, we argue again as for claim 15 that this feature is not connected to any advantageous or technical effect and so it cannot serve to justify the inventive step of this claim. Therefore it is believed that, despite D1 does not refer to sows, a skilled person in view of D1 would readily understand in an obvious manner that he would be able to work either with pig hides (male skin) or sow hides (female skin).

Therefore, claim 21 is not considered inventive in the light of D1.

**CLAIM 22**

Claim 22 depends from claim 21 and it specifies that the porcine collagen is derived from limed sow hides or limed young pig hides.

This is a continuation of the inventive step attack to claim 21 and so the comments made therein specially with regard to the lack of any technical effect of the hides being from sows, are valid.

On the other hand, in page 3 line 34 it is mentioned the need of checking after an acid treatment the absence of lime. This indicates that the hides must have previously had a certain amount of lime. Therefore it is submitted that the feature of the porcine collagen being derived from limed hides is contained in D1.

Therefore claim 22 is lacking inventive step with regard to D1.

**CLAIM 23**

Claim 23 is dependent from any of its preceding claims and it adds the feature that the collagen solids content in the extrudable gel (in a weight basis) is 3.5 to 10% of the gel.

The range of 3.5 to 10% does not seem to have any specific effect from the specification of EP 1423016, it is just an arbitrary range. It is therefore believed that a skilled person would have been able to choose this range as an optional alternative without exerting any inventive effort.

In any case, if this is not deemed sufficient D2 discloses that the fluid mass may have a solid collagen content ranging from 1-25% (see page 17 line 5) D3 also advises of adjusting to solid content of 4-6% see case 2 page 5. Therefore, it is believed that, in any case, a skilled person in view of the

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teachings of D2 and D3 would have been motivated to form a collagen gel having a collagen solid content in the range of 4-7% of weight of gel.

Therefore, following the attack to claim 1 based on D1 and for the reasons mentioned above we strongly hold that claim 23 does not involve an inventive step in view of D1 alone or in combination with either D2 or D3.

**CLAIM 24**

Claim 24 is dependent on claim 23 and it narrows the range of the porcine collagen of the extrudable gel to 4-7% on a weight basis.

All the comments made for the attack to claim 23 are also valid for the attack to claim 24 and so we strongly hold that claim 23 does not involve an inventive step in view of D1 alone or in combination with either D2 or D3.

**CLAIM 25**

Claim 25 is dependent in any of the preceding claim and it adds that the casings have a cold wet tensile strength in the longitudinal direction of at least 2.0 Kg and more preferably 2.5 Kg.

We want to point out that this is not a feature of the casing described in EP 1423016 but rather one of the casing's property derived from the composition used in its preparation. In other words, if any person prepares a casing as defined in claim 1, he would obtain a casing with a cold wet tensile strength in the longitudinal direction of at least 2.0 Kg.

As we have already explained claim 1 is anticipated by D1; thus it is believed that D1 implicitly discloses a casing having a cold wet tensile strength in the longitudinal direction of at least 2.0 Kg.

Therefore claim 25 is lacking novelty in the light of D1.

**CLAIM 26**

This claim is dependent in any of its precedent claims and it adds that the burst strength of the casing is at least 0.5 Kg, and preferably at least 0.6 Kg and more preferably 2.5 Kg.

All the comments made for claim 25 are valid for claim 26 with the exception that the property defined is the burst strength instead of cold wet tensile strength.

Therefore for analogous reasons it is submitted that claim 26 is not novel in the light of D1.

**CLAIM 27**

Claim 27 is dependent from any preceding claim and it adds the feature of the casing including a cross-linking agent.

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As a continuation of the attack to claim 1 based on D1, it is additionally stated that D1 does not specifically disclose the presence of any cross-linking agent, however it is common general knowledge for a skilled person that in order to improve the collagen casing strength the extruded collagen gel may be subjected to a treatment with a cross-linking agent (typically aldehydes) in order to facilitate the cross-link of the collagen fibers. In fact, this is mentioned in D2 where the use of different cross-linking agents is suggested (see page 16 lines 28-37). Also D3 mentions the use of cross-linking agents such as glyoxal or formaldehyde (see page 4 point 10 of the process).

Therefore, it is submitted that claim 27 lacks inventive step in view of D1 and the common general knowledge or in combination with D2 or D3.

**CLAIM 28**

Claim 28 is dependent from any of its preceding claims and it adds the feature that the casing includes a colouring and/or a flavouring agent.

In a similar manner as for claim 27, it is believed that colouring and flavouring agents are well known for any skilled person. Any skilled person desiring to give a certain colour or flavour to a casing will readily think about using a colouring or a flavouring agent without exerting any inventive effort. It is submitted that the use of such agents do not provide any technical effect to the invention disclosed in EP 1423016.

Therefore following the attack to claim 1 in view of D1 and the common general knowledge it is believed that claim 28 is lacking inventive step.

**CLAIM 29**

Claim 29 defines a porcine collagen casing derived from split sow hides, the collagen casing having a ratio of collagen to fat of at least 2.5 to 1.

As we have already mentioned for claim 14, D1 discloses the used of split hides for the manufacture of the casing. Also as explained for attacking claim 1, D1 discloses a collagen casing having a ratio of collagen to fat of at least 2.5 to 1. The only difference between claim 29 and the disclosure of D1 is that the latter does not specifically disclose the use of sow hides. In any case, we have already argued for claim 15 that this feature does not provide any technical effect and that it cannot be used to justify an inventive step.

Therefore, we hold that claim 29 does not involve any inventive step.

**CLAIM 30**

Claim 30 defines a *"sow hide for use in a process of manufacturing a casing as claimed in any one of claims 1 to 29"*. It is submitted that sow hides are commonly known and that their intended use cannot provide novelty and/or inventive step to a claim. It is therefore submitted that claim 30 is not novel in view of common general knowledge.

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**CLAIM 31**

Claim 31 is identical to claim 30 with the exception that the sow hides defined are splitted. With an analogous argument it is submitted that claim 31 is not novel in view of common general knowledge.

**CLAIM 32**

As already discussed for claim 1, D1 already discloses a porcine collagen casing wherein the ratio of collagen to fat is at least 2.5 to 1. Said collagen casings, are said to be used as casings for sausages of diverse characteristic (see page 1 paragraph 2 and page 2 lines 14-16). One of these characteristics to be highlighted is of course the kind of meat for filling the casing and porcine meat is one of the most used in the preparation of sausages. We therefore believe that a pork sausage having a porcine collagen casing wherein the ratio of collagen to fat is at least 2.5 to 1 is implicitly taught in D1.

Therefore, claim 31 is not novel in view of D1.

**CLAIM 33**

Claim 33 defines (letter a, b, c have been included for ease of reference):

*"A method of manufacturing a tubular food-product casing comprising the steps of:*

- a) obtaining a source of porcine collagen*
- b) processing the collagen including partially deffating and acidifying and homogenising the collagen to produce a substantially fibrous paste;*
- c) Processing the paste to form an extrudable gel having a collagen solids content in the range of 4% to 7% by weight of gel, and*
- d) extruding the gel to form a tubular casing and coagulating the extruded casing to produce a tubular casing with a ratio of collagen to fat of at least 2.5 to 1"*

D1 describes a method for manufacturing a tubular food-product casing (see page 1 paragraph 2 and page 2 lines 14-16).

Step a) is also disclosed. For instance, D1 states that the source of porcine collagen is obtained from split hides from the slaughter, from full hide from tanneries (see page 3 lines 3-4) or from pig intestine (see page 11 line 11).

Step b) is disclosed in full in D1. The deffating step is described in the section "preparing the pig hide" (see specifically page 3 lines 7-12 and 28-30). The acidification and homogenisation of the collagen is also disclosed in page 7 lines 15-18.

With regard to step c), D1 discloses the processing of the paste to form an extrudable gel (see page 7 line 18 to page 8 line 30).

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Finally, as explained for claim 1, D1 discloses the extrusion of the gel to form a tubular casing which is coagulated and which has a ratio of collagen to fat of at least 2.5 to 1.

Thus the only difference between D1 and the process of claim 33 is that D1 does not disclose that the extrudable gel obtained in step c) has a solid content in the range of 4% to 7% by weight. This range does not seem to have any specific effect from the specification of EP 1423016, it is just an arbitrary range. The specification actually discloses that the collagen solid content may be broader (see paragraph 22). It is therefore believed that a skilled person would have been able to choose this range as an optional alternative without exerting any inventive effort.

In any case, if this is not deemed sufficient D2 discloses that the fluid mass may have a solid collagen content ranging from 1-25% (see page 17 line 5). D3 also advises of adjusting to solid content of 4-6% see case 2 page 5. Therefore, it is believed that in any case a skilled person in view of the teachings of D2 and D3 would have been motivated to form a collagen gel having a collagen solid content in the range of 4-7% of weight of gel.

Therefore, for the reasons mentioned above, we strongly hold that claim 33 does not involve an inventive step.

**Conclusion**

We therefore request patent EP 1423016 to be revoked. We believe that the patent does not meet the requirements of novelty (Art. 54 EPC), inventive step (Art. 56 EPC) and sufficiency of disclosure (Art. 83 EPC).

Oral proceedings are requested should the EPO not intend to revoke the opposed patent in its entirety.